Metrico Wireless Datum Dialer
User's Manual

Document Version Number: 1.0

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1 Introduction

The Metrico Wireless Datum Mobile system provides device-based data testing, including configurable test scenarios and local and centralized results analysis. Datum also offers the following Call Performance and Multi-RAB test cases:

- Mobile Originated Calls
- Mobile Terminated Calls (coming soon)
- Mobile Originated Multi-RAB Calls
- Mobile Terminated Multi-RAB Calls (coming soon)

The Multi-RAB call test cases enable testing of LTE Circuit Switch Fall Back behavior. Voice call control for Multi-RAB test cases is facilitated by the Datum Dialer application.

Benefits of testing Multi-RAB with Datum include:

- Precise control of test flow in that the voice call will always be placed in the middle of a data transaction
- Precise measurement of the following KPI's:
  - Call Setup Rate
  - Call Drop Rate
  - Call Setup Time
  - Call Duration
  - Throughput measurements before the call is set up, during the call and after the call has ended
- Measurement of Radio Access Technology during tests
- Measurement of LTE CSFB performance

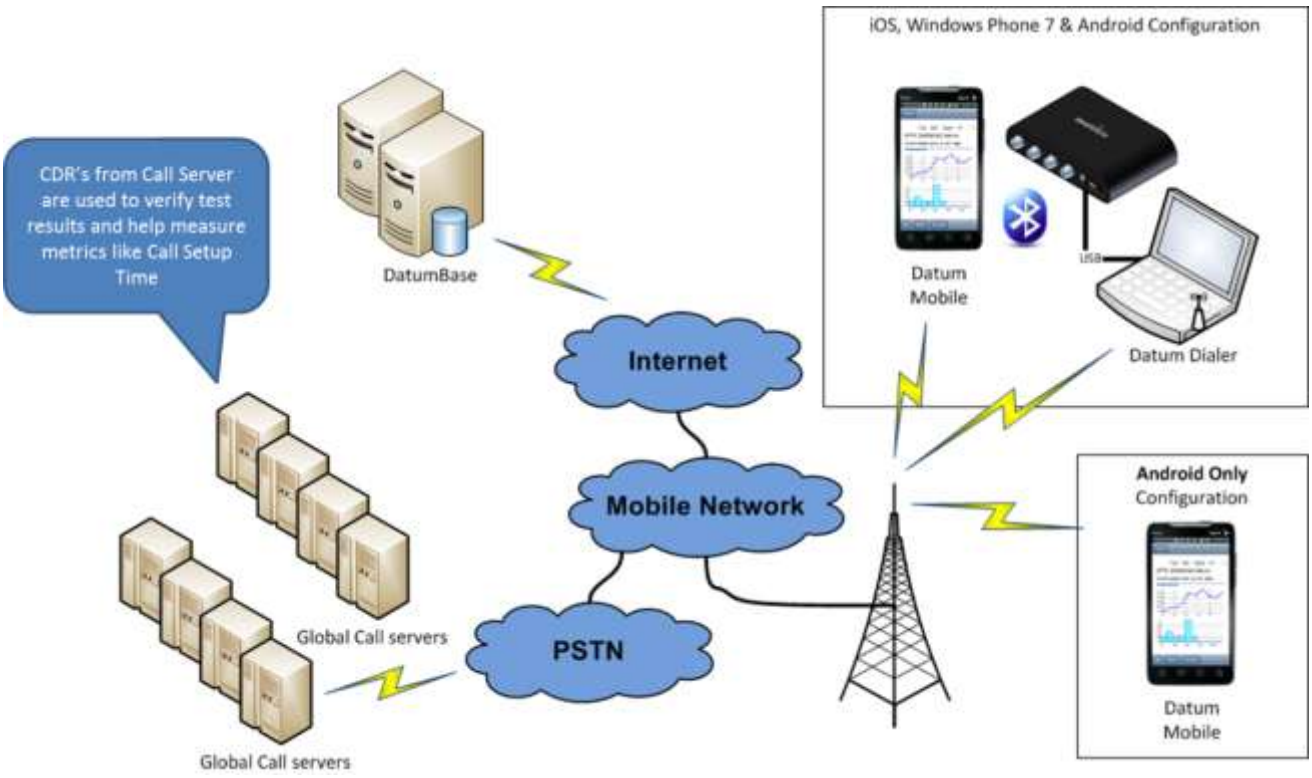

Figure 1-1 - Metrico Cloud Infrastructure

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Datum Dialer is the Metrico solution that facilitates voice call control on mobile devices for Datum Mobile Call Performance and Multi-RAB testing. Although limitations with some of the major mobile platforms (i.e. iOS and Windows Phone 7) prevent third party applications such as Datum from dialing, answering and hanging up calls directly[1], Datum Dialer overcomes these limitations:

- Datum Dialer is a PC-based application
- Datum Dialer coordinates with Datum Mobile to
  - Dial voice calls
  - Answer voice calls
  - Hang-up voice calls
  - Correlate CDR records
- Calls are controlled via Bluetooth
- The system supports up to 4 devices

Figure 1-2 - Datum Dialer Configuration

This guide is intended for the Datum Dialer user and describes how to perform call performance and Multi-RAB testing using Datum Dialer.

[1] The Android platform allows Datum to control voice calls directly. Datum Mobile for Android supports the MOBILE_ORIGINATED_CALL and MOBILE_ORIGINATED_CALL_MULTIRAB tasks directly without the need for Datum Dialer.

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2 Datum Dialer Installation

Datum Dialer contains both hardware and software for Call Performance and Multi-RAB testing using Datum. Prior to installing Datum Dialer for the first time, please verify that all hardware components are present, including a laptop meeting the Datum Dialer computing requirements. Also note that when setting up Datum Dialer for the first time, the software must be installed prior to connecting the hardware. The following sections describe the system configuration process.

2.1 System Component Verification

The standard hardware components to be used with Datum Dialer are:

- Metrico Wireless ME (Mobile Equipment) hardware unit
- USB cable
- AC adapter
- Cigarette lighter adapter

A laptop computer and a test mobile are required to conduct tests using Datum Dialer. Any computer used with Datum Dialer must meet the Datum Dialer minimum computing requirements:

Computing Requirement	Optimal Performance	Minimal Performance
Processor	Intel® Core™ i3	Intel® Atom™
RAM	8 GB	3 GB
Free Disk Space	20 GB	10 GB
Operating System	Windows XP, Vista or 7	Windows XP
USB Drive	N/A	USB 2.0 Drive
Software	N/A	• Microsoft .NET Framework 4 (software will prompt for install if required)
Dedicated High Speed Internet Connection	N/A	Sustained internet connection of at least 50 kbps is required at all times while testing. Please see Appendix A for more information about how Datum Dialer uses the internet connection.

2.1.1 Microsoft .NET Framework 4

The Datum Dialer software application requires Microsoft .NET Framework 4. The Datum Dialer software installation includes this component, and will prompt the user to install if not found on the system.

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2.1.2 Disable User Account Control (Windows Vista and Windows 7)

The Datum Dialer software application requires that the **User Account Control (UAC)** setting be disabled on Windows Vista and Windows 7 machines.

To disable UAC in Windows Vista:

- From the **Windows Start** menu select **Settings** → **Control Panel**.
- Under **User Accounts and Family Safety** select **Add or remove user accounts**.

Figure 2-1 - User Accounts and Family Safety Area

- Click on any user account (i.e. the Guest account).
- In the list of user account options, select **Go to the main User Accounts page**.

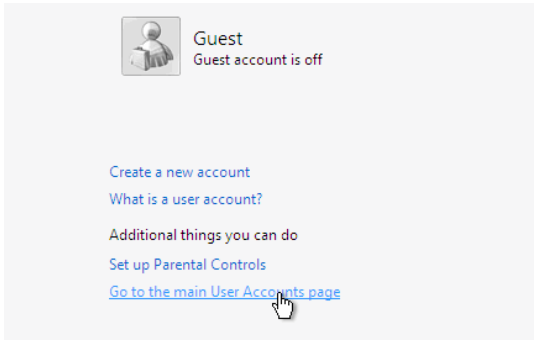
Guest
Guest account is off
Create a new account
What is a user account?
Additional things you can do
Set up Parental Controls
Go to the main User Accounts page

Figure 2-2 - User Account Options

- Under **Make changes to your user account**, select **Change security settings**.

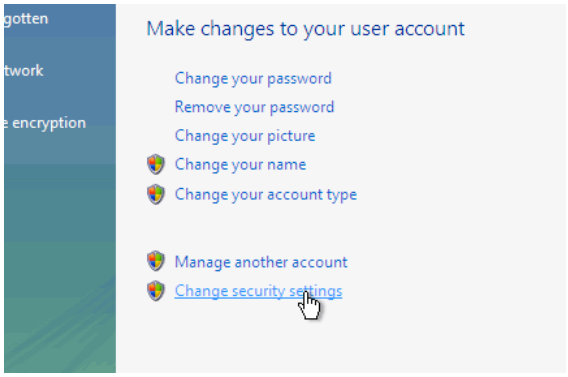

Figure 2-3 - Make changes to your user account

- Deselect **Use User Account Control (UAC) to help protect your computer**.

User Accounts • Change Security Settings
Search
Turn on User Account Control (UAC) to make your computer more secure
We recommend that you leave User Account Control (UAC) on because it helps prevent unauthorized changes to your computer. When UAC is on and you are using an administrator account, Windows will ask you for permission when you try to do something that requires administrative rights (such as installing software or changing settings that affect other users). When UAC is on and you're using a standard account, Windows will ask for an administrator password to make these types of changes.
Use User Account Control (UAC) to help protect your computer
OK
Cancel

Figure 2-4 - User Account Control Screen

- Click **OK** to confirm your selection.
- When prompted, restart your computer to apply the changes.

To disable UAC in Windows 7:

- From the **Windows Start** menu select **Settings** → **Control Panel**.
- Under **User Accounts and Family Safety** select **Add or remove user accounts**.

Figure 2-5 - User Accounts and Family Safety Area

- Click the **User Accounts** link.

Figure 2-6 - User Accounts Area

- In the list of user account options, select **Go to the main User Accounts page**
- Select the **Change User Account Control Settings** option.

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Figure 2-7 – Make changes to your user account Screen

- Lower the notification bar from **Always notify** to **Never notify**.

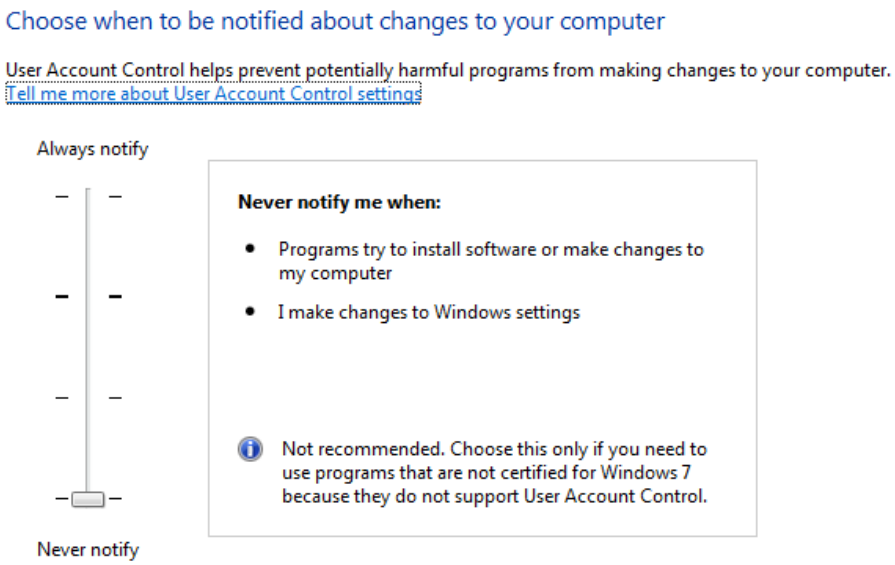
Choose when to be notified about changes to your computer
User Account Control helps prevent potentially harmful programs from making changes to your computer.
Tell me more about User Account Control settings
Always notify
Never notify
Never notify me when:
Programs try to install software or make changes to my computer
I make changes to Windows settings
Not recommended. Choose this only if you need to use programs that are not certified for Windows 7 because they do not support User Account Control.

Figure 2-8 - User Account Control Screen

- Click **OK** to confirm your selection.
- When prompted, restart your computer to apply the changes.

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2.2 Software Installation

The Datum Dialer installation file may be obtained from your Metrico Wireless representative. Once you have the Datum Dialer installation package:

- Unzip the package (if applicable) and click on **Setup**.
- Follow the instructions to complete the software installation.

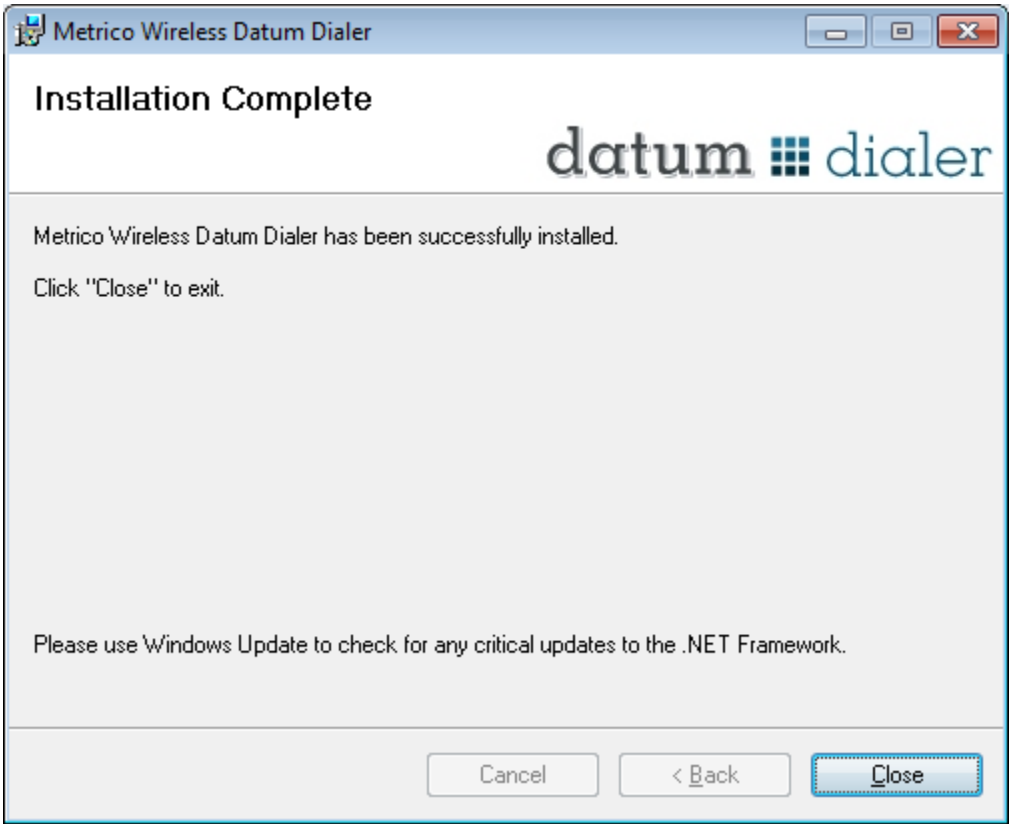
Metrico Wireless Datum Dialer
Installation Complete
datum dialer
Metrico Wireless Datum Dialer has been successfully installed.
Click "Close" to exit.
Please use Windows Update to check for any critical updates to the .NET Framework.
Cancel
< Back
Close

Figure 2-9 – Datum Dialer Installation Complete

After Datum Dialer has been installed, the software will inform you automatically when upgrades are available provided that:

- The computer running the Datum Dialer software is connected to the internet.
- The **Check for updates on startup option** has been checked in the **Settings** → **Application Settings** menu.
- Support and maintenance is up-to-date for the Datum Dialer license in use.

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2.3 Hardware Installation

Figure 2-10 - Metrico Wireless ME Hardware Unit

Configure the Metrico ME hardware by making the following connections:

- Plug in the **AC Adapter** and connect the **+12V** port on the Metrico unit.
- Connect the **USB laptop cable** to the **PC** port on the Metrico ME unit.
- With the laptop turned on, connect the other end of the **USB laptop cable** to the USB port on the computer. Take note of this port so that you always connect the hardware unit to the same port.
- Make sure that the test handsets are available. The test handsets will be connected during the session configuration process.

The USB hardware detection will take place upon the first connection. A notification will be displayed when the automatic driver installation procedure is complete.

To confirm that the driver has been installed, look for the **Metrico Wireless Devices → Metrico ME Device** in the **Windows Device Manager**.

At this time, the system is configured and ready for testing.

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3 Application Workflow

This section provides an overview of the Datum Dialer application workflow.

These steps are required to perform a Datum test containing one or more MOBILE_ORIGINATED_CALL or MOBILE_ORIGINATED_CALL_MULTIRAB tasks:

- Configure the Datum Base project
- Start Datum Dialer
- Specify Datum Dialer Settings
- Define the test
- Run the Mobile Tests
- Monitor the Test in Progress
- Analyze the Results

The following sections of this document describe the detailed procedures for working with Datum Dialer.

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4 Configure the Datum Base Project

The first step in performing a Datum test containing one or more MOBILE_ORIGINATED_CALL or MOBILE_ORIGINATED_CALL_MULTIRAB tasks is to configure a Datum Base project with a Test-Set containing those tasks and the test mobile to be used. This chapter assumes that the reader has a basic familiarity with Datum Base. Please see the **Metrico Wireless Datum Base Administrator Guide** for full details on configuring a project in Datum Base. To configure the Datum Base project it is necessary to:

- Create the Test-Set
- Add the Test-Set to the project
- Add the test handset to the project
- Install the Datum Mobile client

4.1 Create the Test-Set

Use the Datum Base Test-Set Creator to create a test set containing one or more MOBILE_ORIGINATED_CALL or MOBILE_ORIGINATED_CALL_MULTIRAB tasks. See **Chapter 2** of the **Metrico Wireless Datum Base Administrator Guide** for detailed instructions on Test-Set creation. See **Appendix A** of the same document for the task-specific configuration parameters for these tasks.

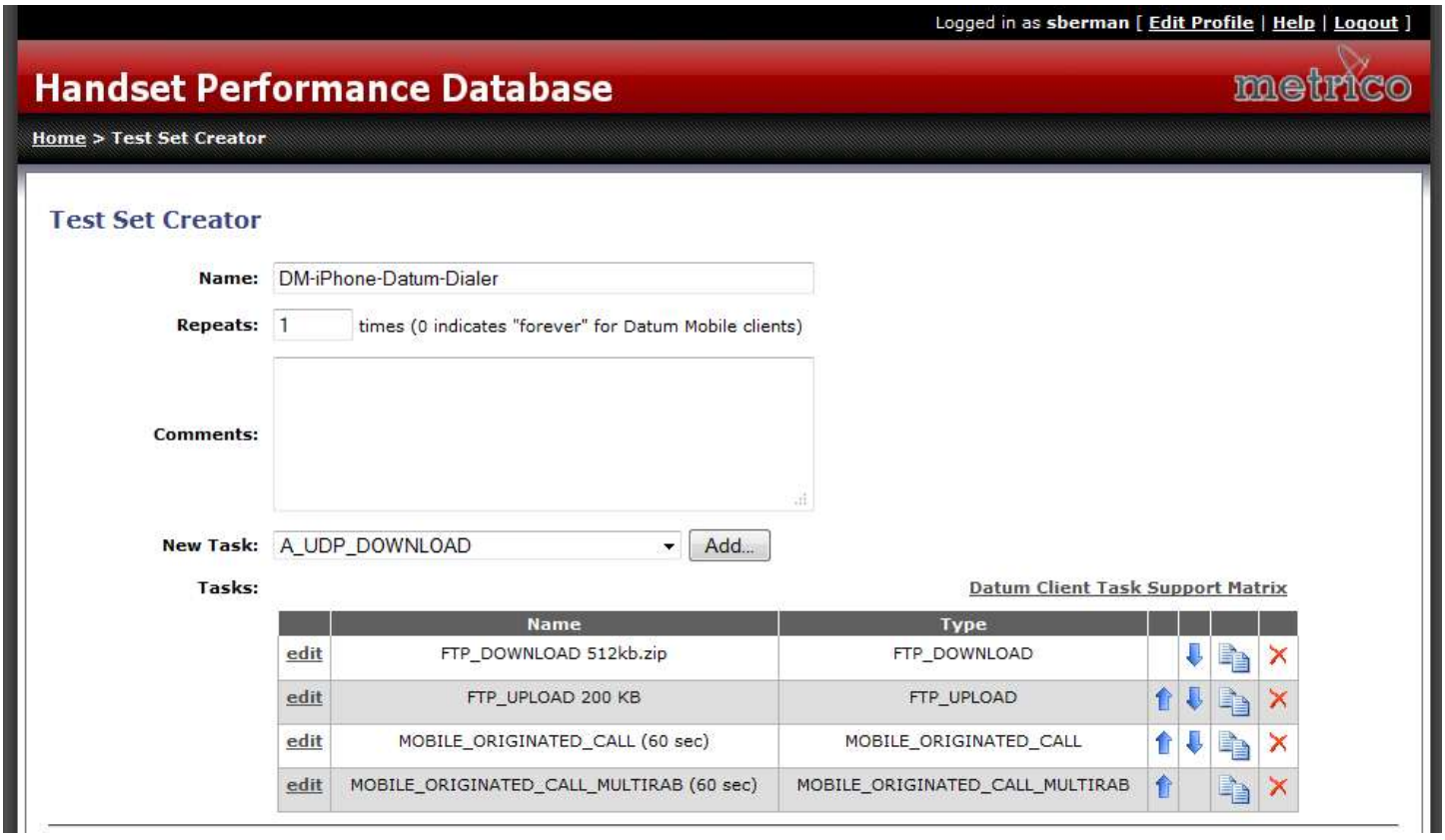
Logged in as sberman [Edit Profile | Help | Logout]
Handset Performance Database
metrico
Home > Test Set Creator
Test Set Creator
Name: DM-iPhone-Datum-Dialer
Repeats: 1 times (0 indicates "forever" for Datum Mobile clients)
Comments:
New Task: A_UDP_DOWNLOAD Add...
Tasks:
Datum Client Task Support Matrix
Name
Type
edit FTP_DOWNLOAD 512kb.zip FTP_DOWNLOAD
edit FTP_UPLOAD 200 KB FTP_UPLOAD
edit MOBILE_ORIGINATED_CALL (60 sec) MOBILE_ORIGINATED_CALL
edit MOBILE_ORIGINATED_CALL_MULTIRAB (60 sec) MOBILE_ORIGINATED_CALL_MULTIRAB

Figure 4-1 - Create the Test-Set

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4.2 Add the Test-Set to the Project

Add the Test-Set to the project to be used for testing. See **Section 3.3** of the **Metrico Wireless Datum Base Administrator Guide** for detailed instructions on uploading a Test-Set to a project.

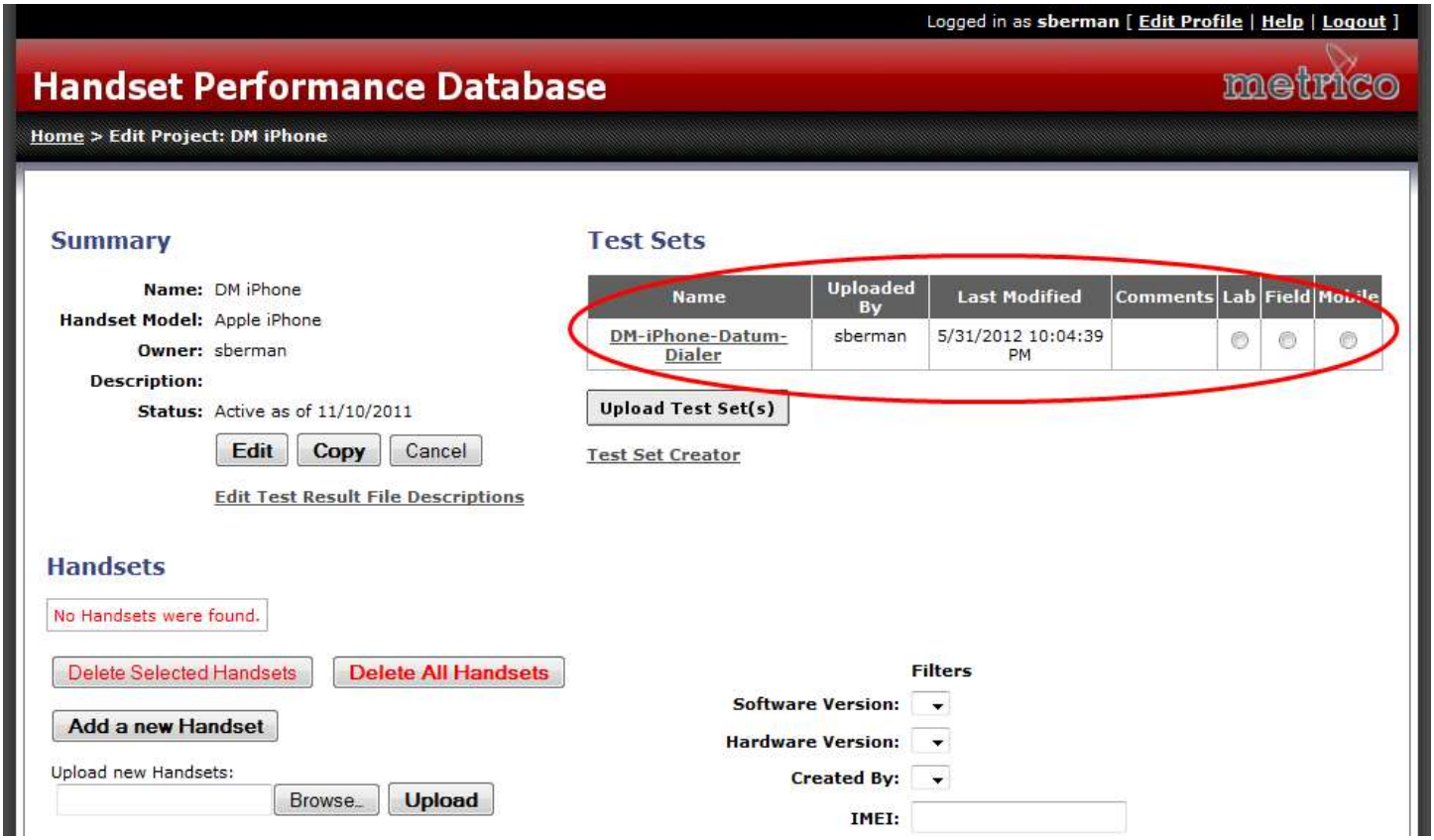

Figure 4-2 - Add the Test-Set to the Project

4.3 Add the Test Handset to the Project

Add the test handset to the project to be used for testing. See **Section 3.4** of the **Metrico Wireless Datum Base Administrator Guide** for detailed instructions on adding handsets to a project.

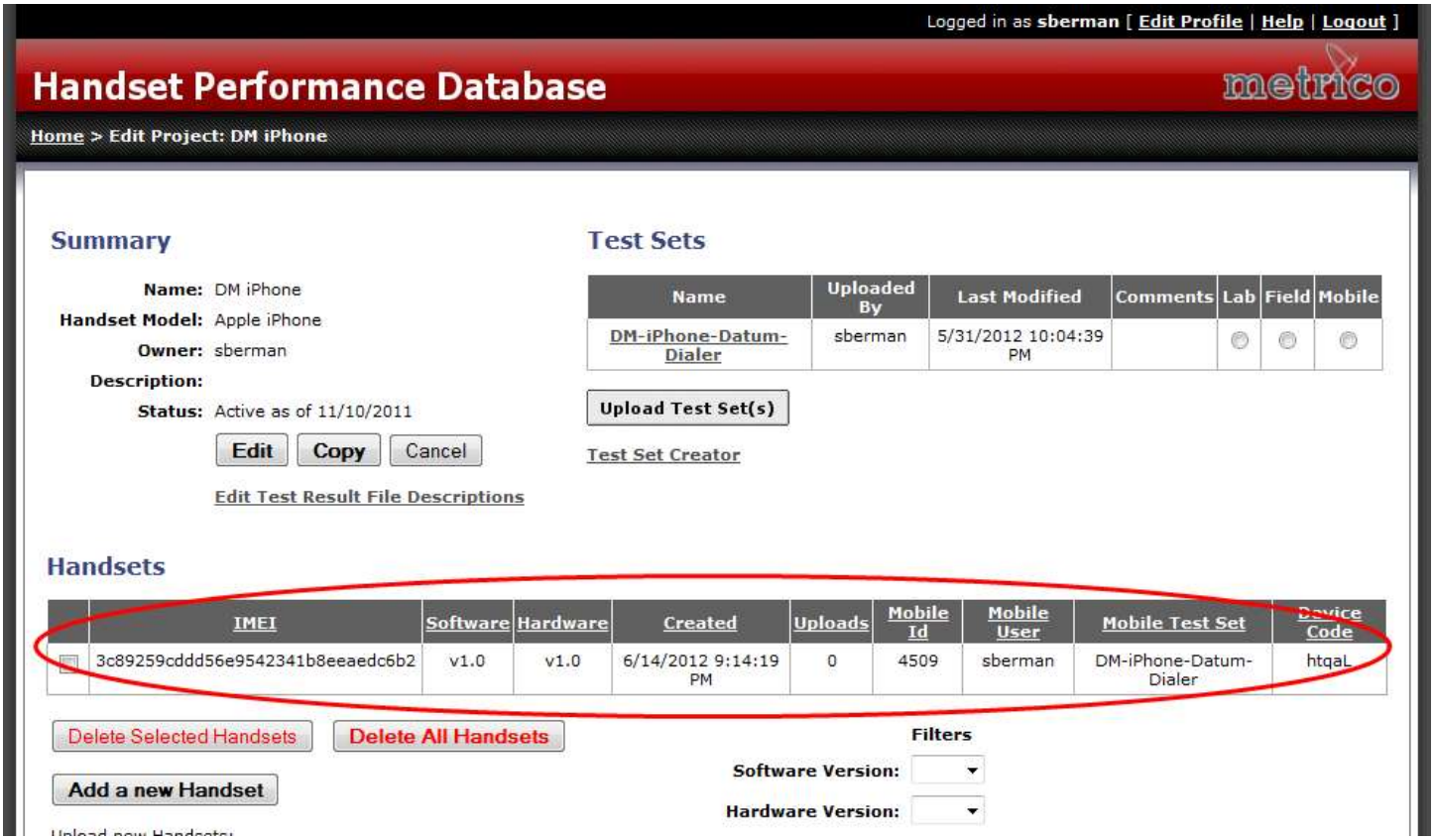

Figure 4-3 - Add the Test Handset to the Project

4.4 Install the Datum Mobile Client

The appropriate Datum Mobile client must be installed and configured (but not yet run) on the test device. These procedures are described in the **Metrico Wireless Datum Mobile Client Guide** for each mobile platform.

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5 Start Datum Dialer

Prior to starting Datum Dialer, please be aware that a dedicated internet connection is required when running tests. Please see Appendix A for more information about how Datum Dialer uses internet connectivity.

When opening Datum Dialer for the first time, the **Activation** dialog will appear. Fill in the fields as appropriate. The **Customer Activation Code**, **Company** and **Email** fields are required. Obtain your **Customer Activation Code** from your Metrico Wireless representative. All other fields are optional. Click **Register** to invoke the online registration process.

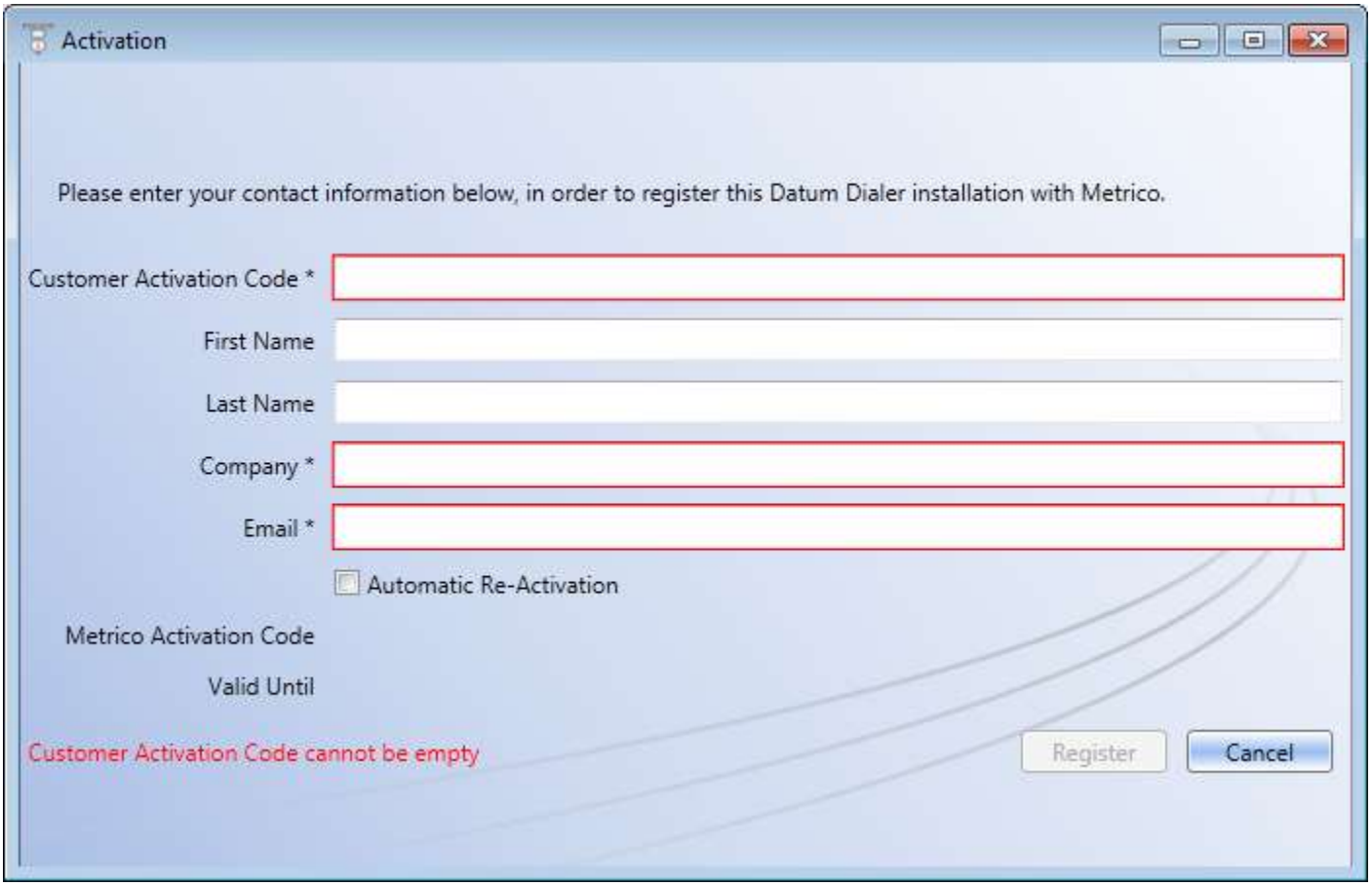

Figure 5-1 - Datum Dialer Activation Dialog

When the **Activation** dialog is dismissed, the Datum Dialer **Start Screen** will appear.

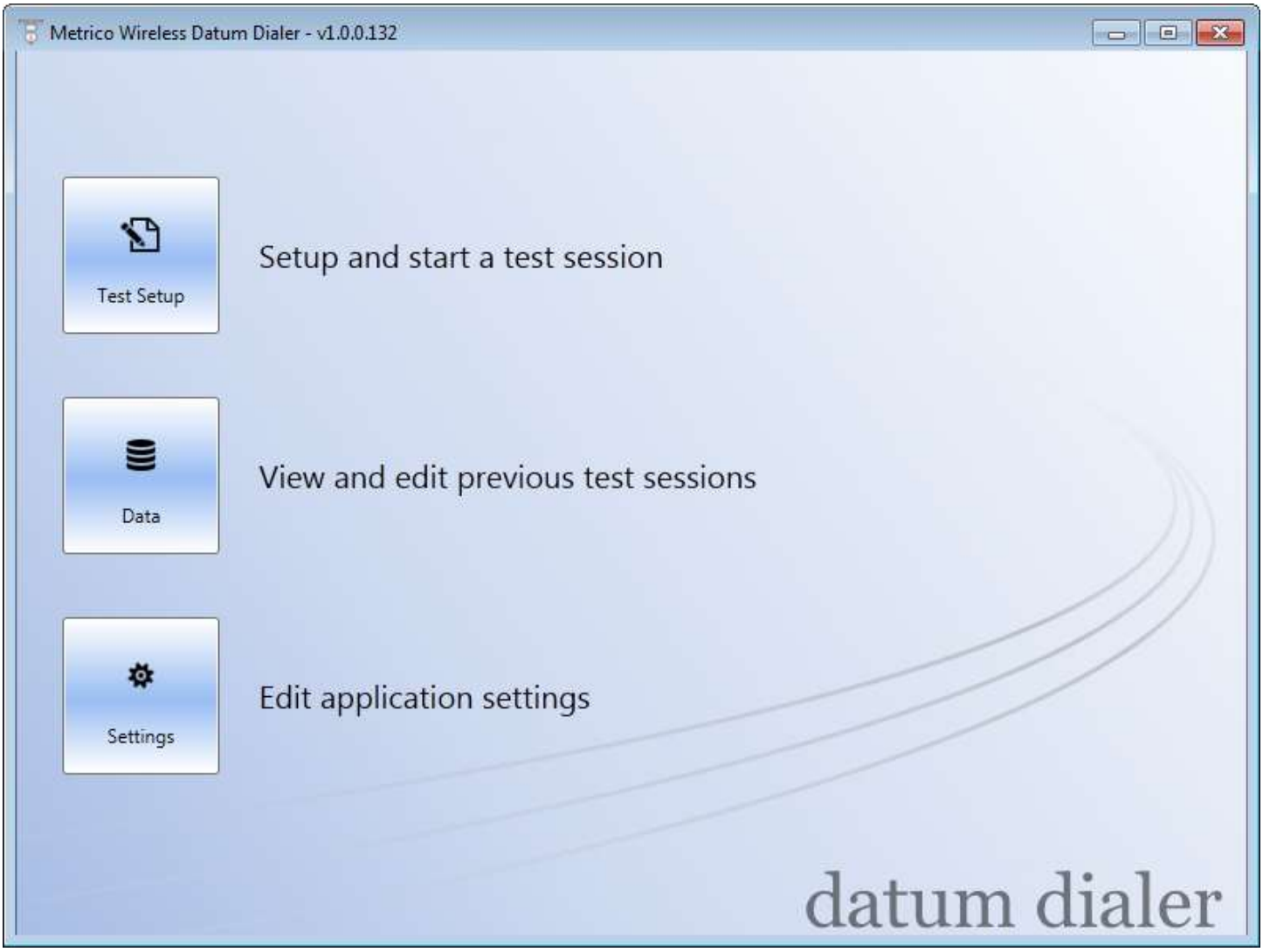

Figure 5-2 - Datum Dialer Start Screen

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6 Specify Datum Dialer Settings

Prior to first use, Datum Dialer must be configured with user preferences. When configuring the program it is necessary to:

- Specify application settings
- Specifying task settings

Each of these configuration settings is available from the **Settings** button on the Datum Dialer **Start Screen**.

6.1 Specify Application Settings

To specify application settings for Datum Dialer on the **Application Settings** screen:

- Choose whether to **Check for updates on startup** to determine whether a newer version of Datum Dialer is available (recommended).
- Choose whether to **Remove leading '1' from Bluetooth device numbers**. Metrico recommends leaving this option checked to account for the leading '1' automatically inserted by Bluetooth in front of the phone number.
- Use the **Check For Updates** button to manually check for software updates.
- Use the **View Activation Data** button to view the customer information entered on the **Activation** screen.

Figure 6-1 - Application Settings Screen

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6.2 Specify Task Settings

To specify task settings for Datum Dialer on the **Task Settings** screen:

- Select the threshold for a display **warning** if no workorder is received by the system.
- Select the threshold for a display **error** if no workorder is received by the system.

Please see Appendix A for more information about how these thresholds are used to monitor a Datum Dialer session.

Metrico Wireless Datum Dialer - v1.0.0.106
Return To Start Screen
Settings
Application Settings
Task Settings
Display warning if no workorder is received after 300 seconds
Display error if no workorder is received after 600 seconds
datum dialer

Figure 6-2 - Task Settings Screen

7 Define the Test

Datum Dialer may be configured to connect to up to four test devices (per availability based on licensing) at one time. When defining a test it is necessary to:

- Assign tasks to channels
- Modify task settings
- Save test settings

All test definition options are available from the **Test Setup** button on the Datum Dialer **Start Screen**. The test definition options are discussed in the following sections.

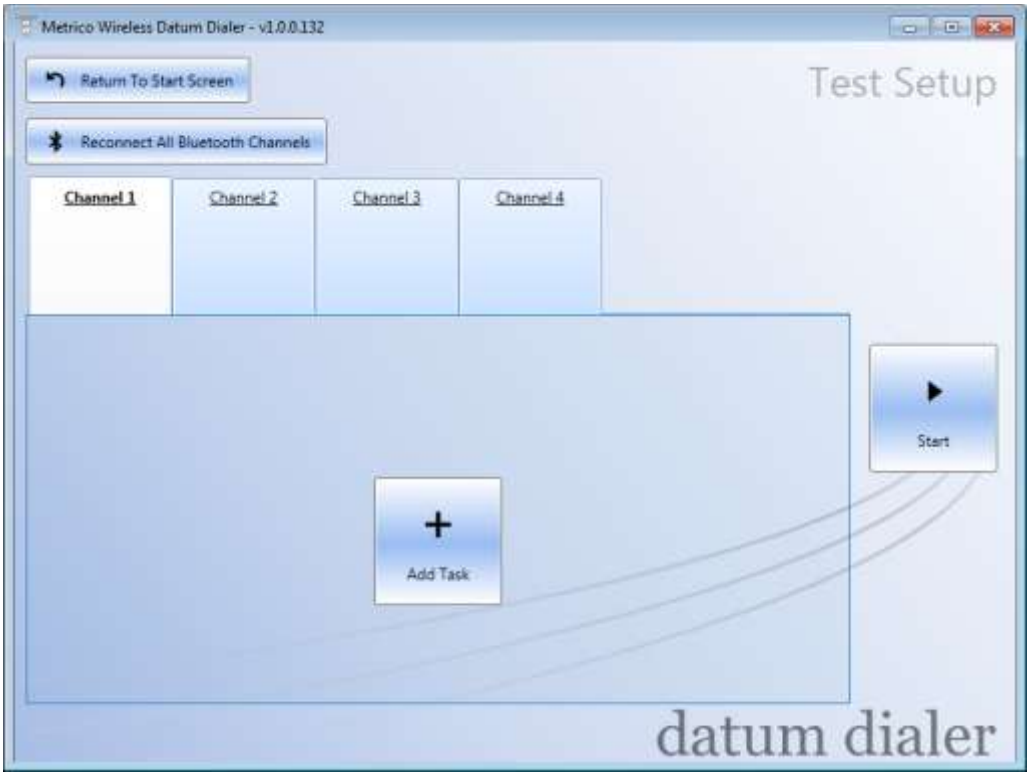

Figure 7-1 - Test Setup Screen

7.1 Assign tasks to channels

A Datum Dialer task may operate on any licensed hardware channel. To assign a task to an available channel:

- Select the channel to be used for testing.
- Click the **Add Task** button.

Repeat this process for all channels to be active during testing.

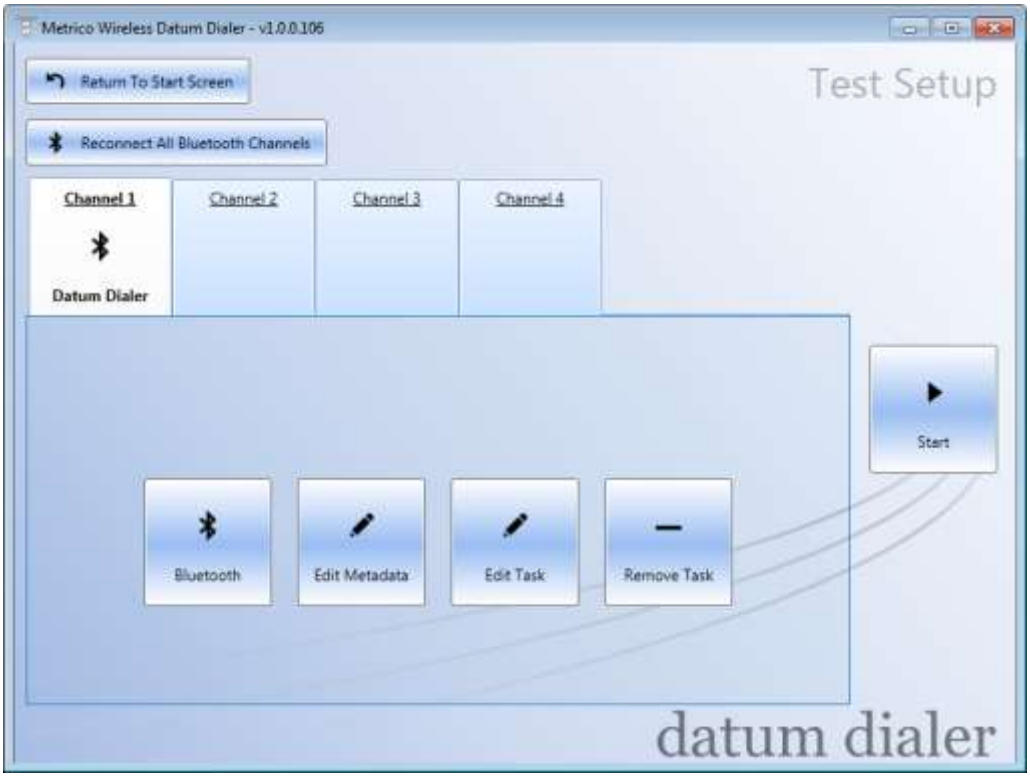

Figure 7-2 - Task Assigned to Channel 1

7.2 Modify task settings

Each assigned task must be configured with specific task settings. Click any assigned channel to modify its configuration. The task settings consist of:

- Bluetooth
- Edit Metadata
- Edit Task

An unwanted task may be removed using the **Remove Task** button.

7.2.1 Bluetooth

Use the **Bluetooth** screen to perform pairing of the test device with the Metrico ME hardware unit.

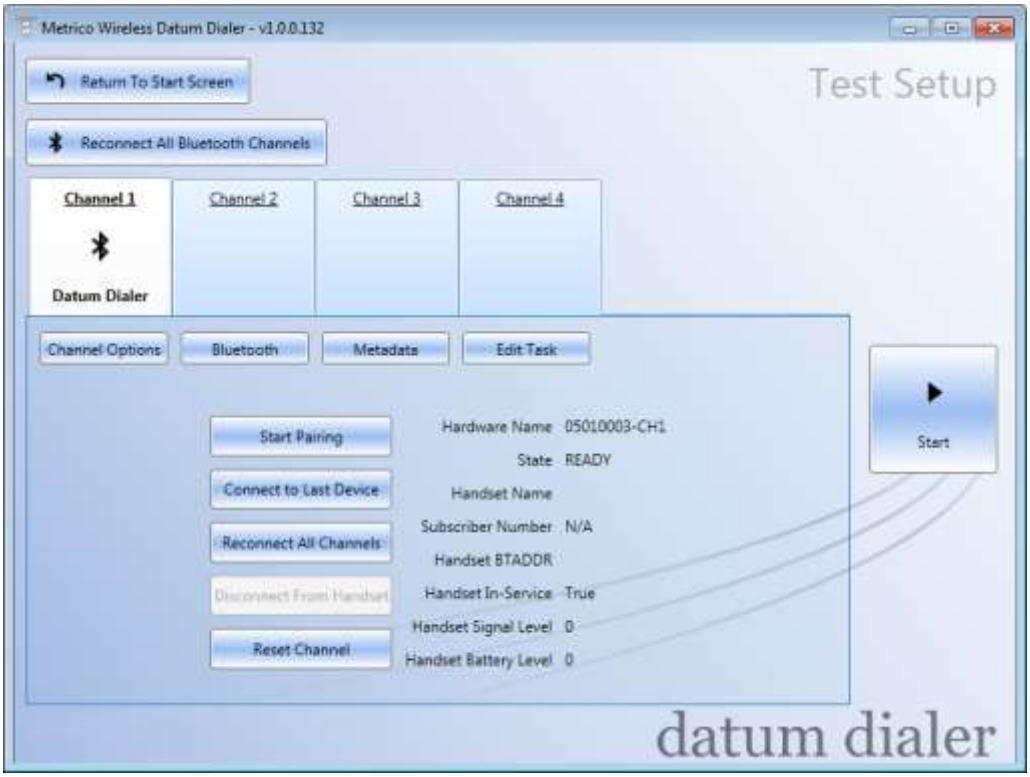

Figure 7-3 - Bluetooth Screen

To pair a device:

- Click the **Start Pairing** button. The corresponding LED will flash blue on the front of the hardware unit.
- Set the mobile to search for Bluetooth devices. This procedure varies among devices, but the option is generally found under the **Settings** or similar menu.
- The mobile may detect multiple channels, but will only be pairable with the channel that is in pairing mode. Select the appropriate channel based on the **Hardware Name** field.
- When prompted for the Bluetooth passkey, enter **0000**.
- When pairing is complete, the hardware will display a solid blue LED at the paired channel. The software will show the paired channel as **CONNECTED**.

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- **Note:** The connection process must be handled manually for some handsets. If the blue light does not appear on the Metrico ME hardware unit and the software does not show the **CONNECTED** state, the phone must be connected manually. This is typically accomplished through the phone's Bluetooth menu system.

Note that if a device has previously been paired with this channel, the above procedure may be bypassed by selecting the **Connect To Last Device** option. Selecting this option will automatically connect the channel to the last device to which it was paired. To reconnect all previously connected Bluetooth channels to the last paired handset, use the **Reconnect All Bluetooth Channels** button found at the top of the **Bluetooth** screen.

7.2.2 Edit Metadata

The fields on the **Metadata** screen provide optional metadata for the session log file and help identify the test devices in session outputs. All fields in this dialog are optional:

- **Make** – The test device manufacturer.
- **Model** – The test device model name.
- **Role** – The role this device plays in the current test (i.e. "Reference", "DUT", etc.).

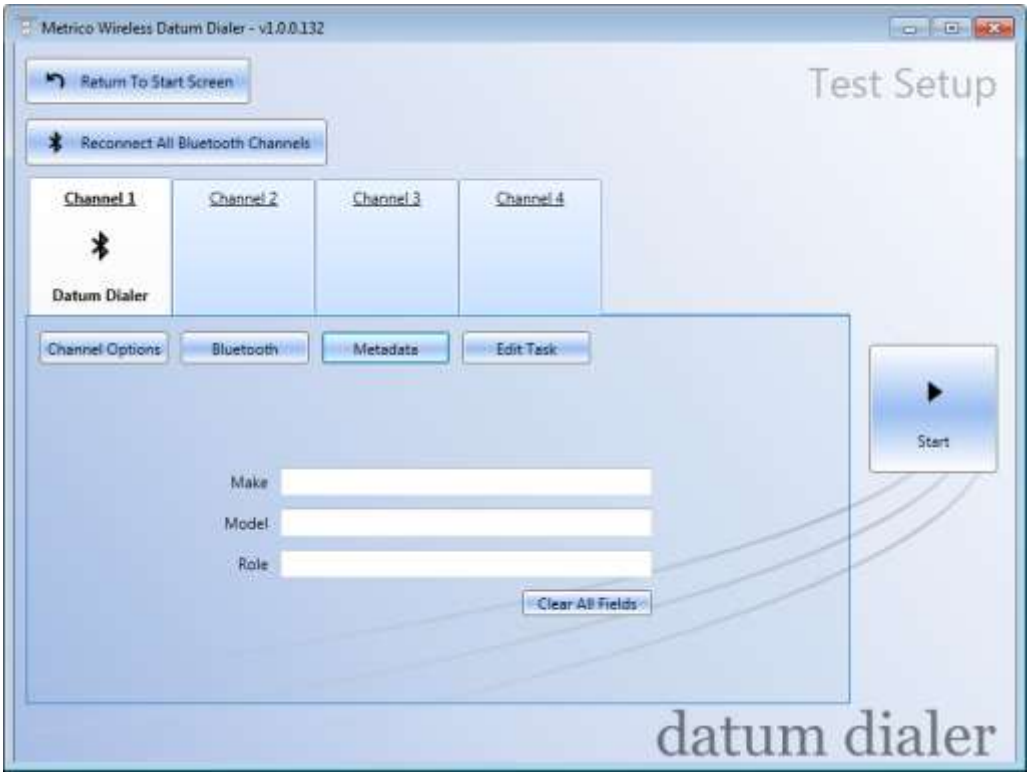

Figure 7-4 - Metadata Screen

7.2.3 Edit Task

The fields on the **Edit Task** screen are used to associate the device connected to the hardware with a handset configured in a Datum Base project.

- **Device Code** – This is a required field. The **Device Code** can be found in several different places:
  - **Within the mobile client** – Click the **Where's my device code?** button to locate this information on the Windows Phone 7 and iOS platforms.
  - **In Datum Base** – On the **Edit Project** page, find the **Device Code** in the **Handsets** table.
- **Device Number** – This is a required field. The **Device Number** is the phone number of the device, entered without any spaces or special characters (i.e. **8005551234**).

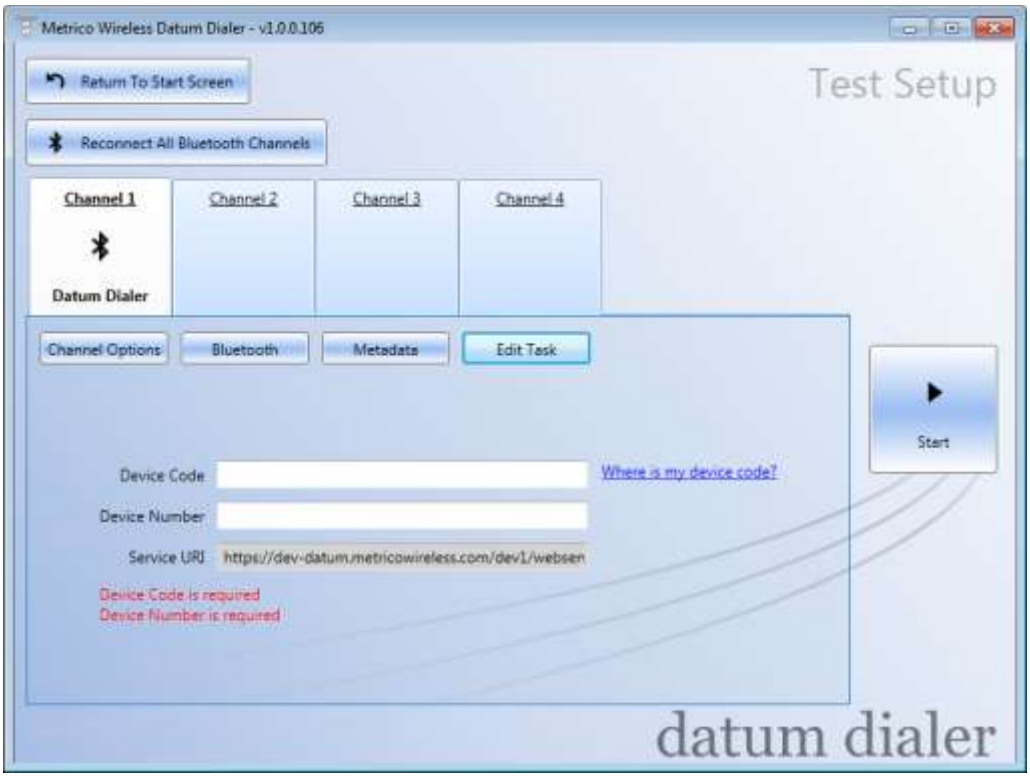

Figure 7-5 – Edit Task Screen

Figure 7-6 - Where's my Device Code?

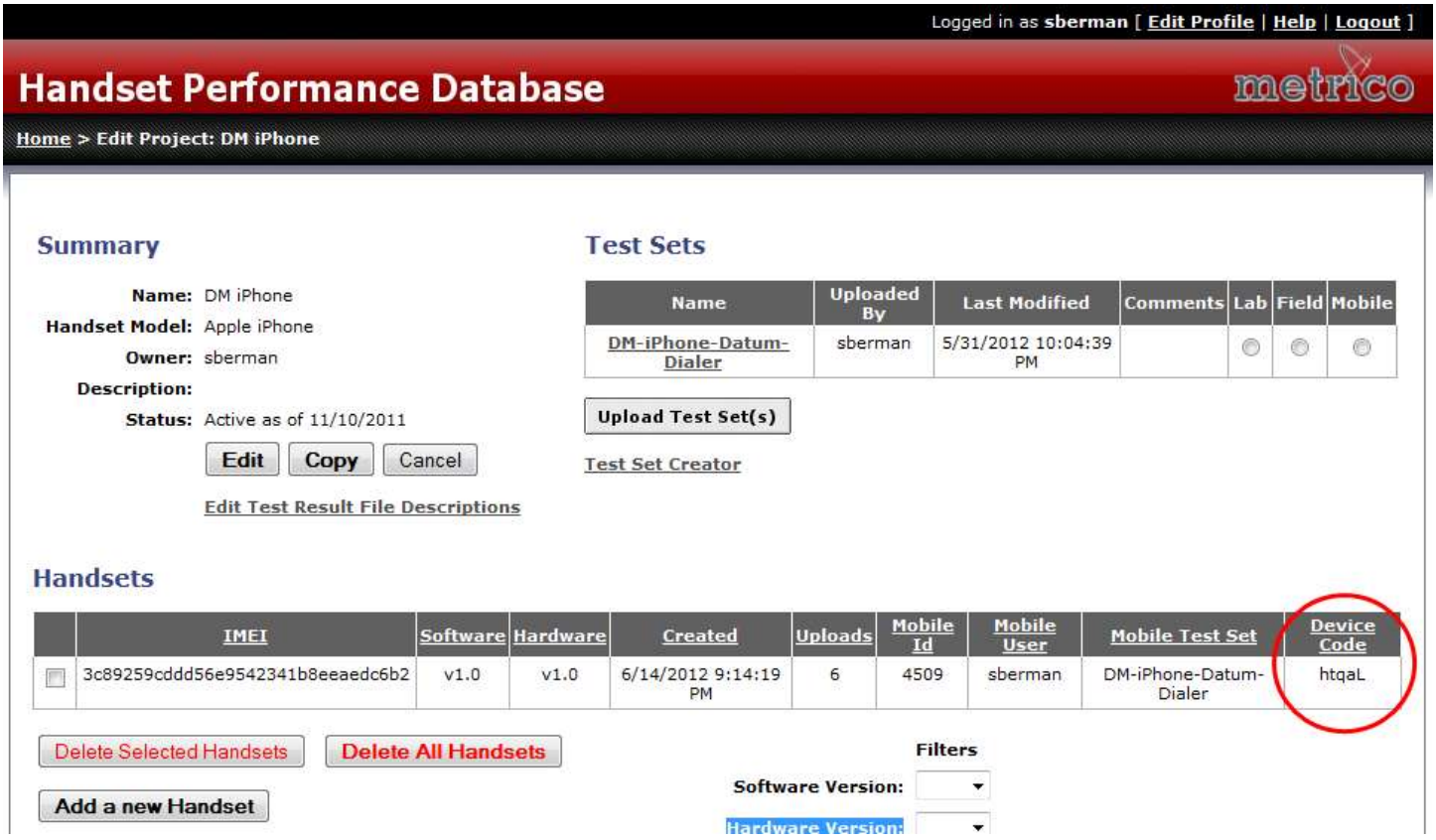

Figure 7-7 - Locating the Device Code in Datum Base

8 Run the Mobile Tests

After the **Bluetooth**, **Metadata** and **Task** settings have been configured, Datum Dialer is ready for testing.

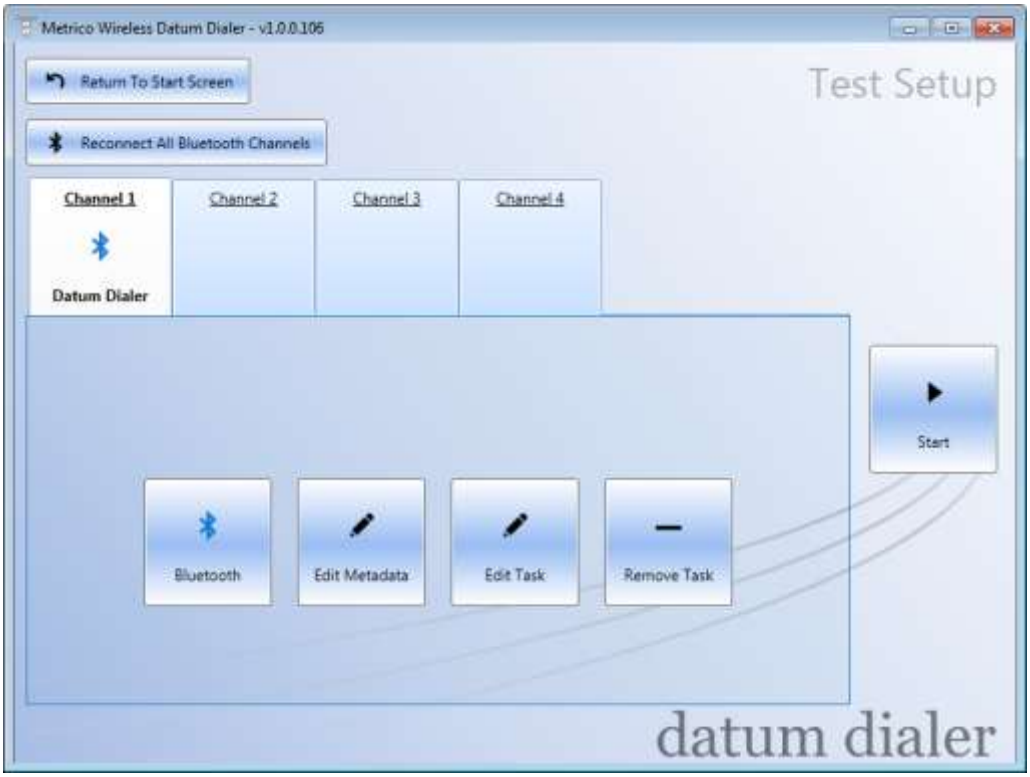

Figure 8-1 - Ready to Test

Please note that a dedicated internet connection is required when running a Datum Dialer test. See Appendix A for more information regarding this requirement.

To start testing:

- Click the **Start** button on the **Test Setup** tab.
- Confirm that the device phone number is entered correctly in the **Confirm Channel Numbers** dialog.

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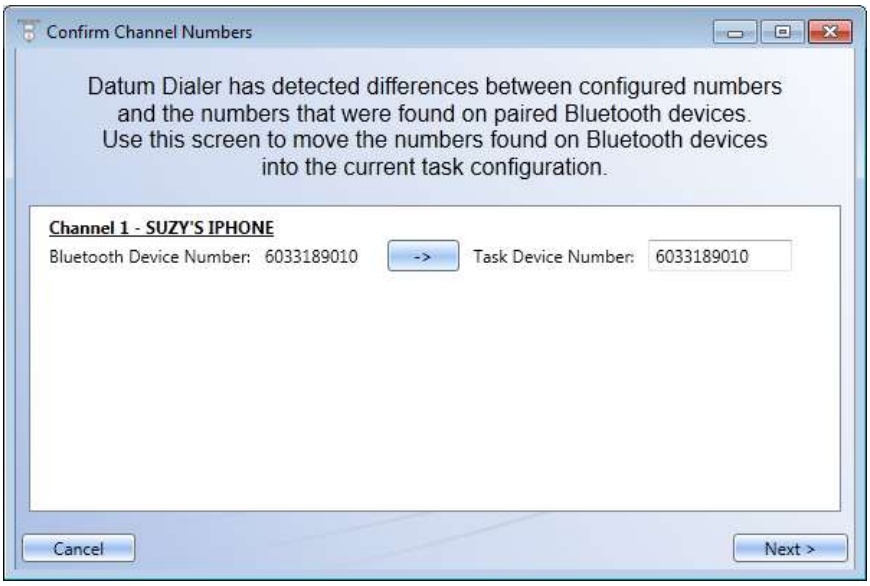
Confirm Channel Numbers
Datum Dialer has detected differences between configured numbers and the numbers that were found on paired Bluetooth devices. Use this screen to move the numbers found on Bluetooth devices into the current task configuration.
Channel 1 - SUZY'S IPHONE
Bluetooth Device Number: 6033189010
->
Task Device Number:
6033189010
Cancel
Next >

Figure 8-2 - Confirm Channel Numbers Dialog

- Specify the log file storage location and other session information:
  - In the **File Path** area use the **Browse** button to select a log file location and file name. This field is required.
  - Complete the **User Name**, **Route/Location** and **Description** fields as desired. This information serves as optional metadata written to the session logfile.
  - Click **Next** to continue.

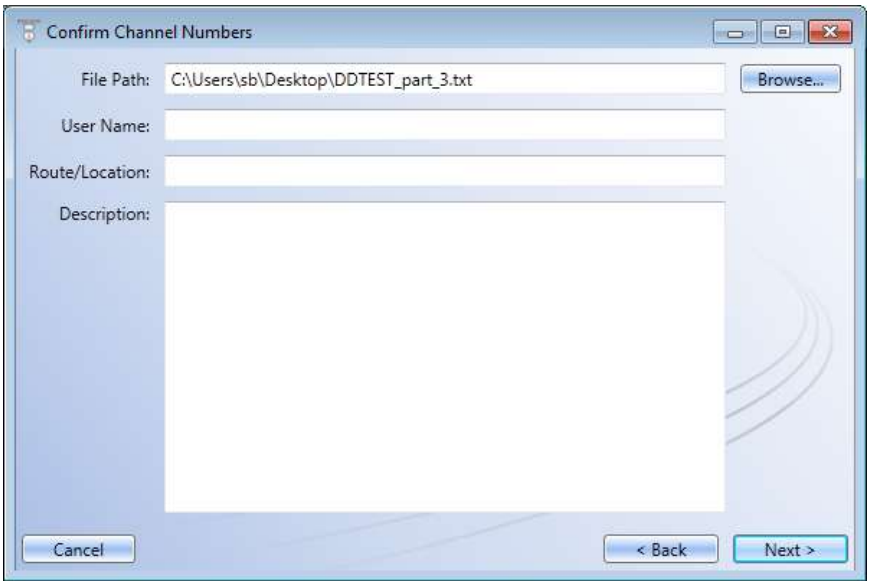

Figure 8-3 - Specifying the Log File Storage Location and Session Information

- Start the test on the Datum Mobile client. See the **Metrico Wireless Datum Mobile Client Guide** for the applicable platform for instructions on starting the test.
- When prompted with the **Is Datum Dialer Running?** notice on the test client, click **Continue** to proceed with testing.

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9 Monitor the Test in Progress

While a test is in progress, Datum Dialer will display information about the active task as well as summary information for the entire test. The abbreviations on this screen are defined as:

- **TTOL** – Total time online
- **Avg AT** – Average access time
- **DCC** – Dropped call count

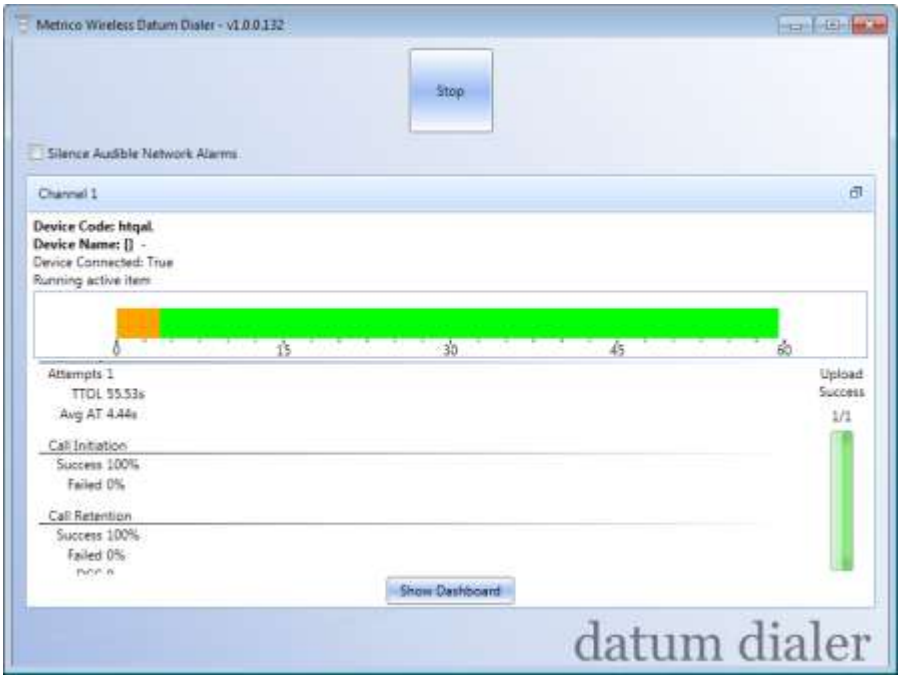

Figure 9-1 - Datum Dialer Test in Progress

Use the **Show Dashboard** button to display the **Listener Task Dashboard**. The **Listener Task Dashboard** provides a graphical summary of the call retention status.

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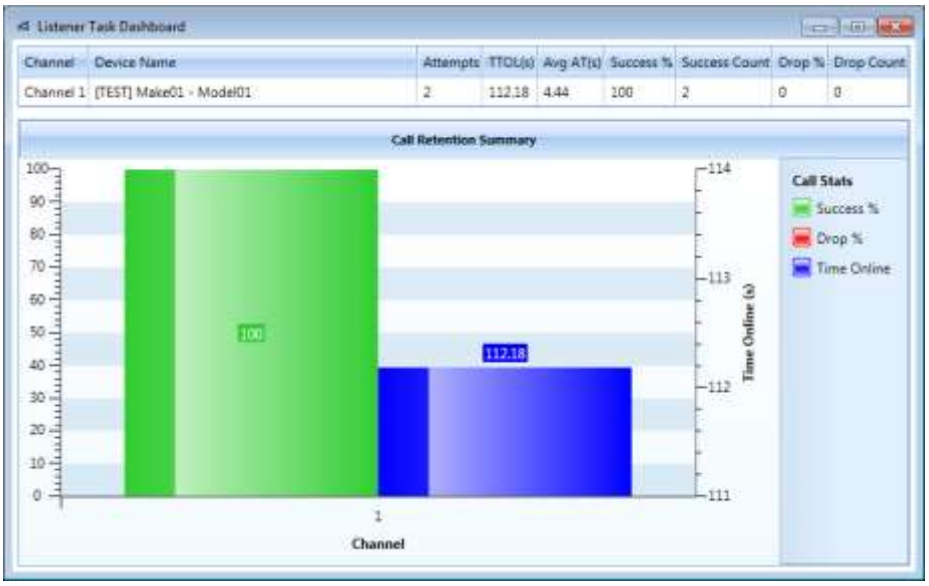

Figure 9-2 - Listener Task Dashboard

Between tasks, the **Last workorder** area of the In Progress screen will display the time in seconds since the last voice call control message was received from Datum Base. Set the thresholds for the warning and error alerts in this area on the **Datum Dialer Settings** → **Task Settings** screen.

- A workorder warning will be displayed in yellow for a shorter outage.
- A workorder error will be displayed in red for a longer outage.
- An audible alarm will sound in the event that internet connectivity is lost. This makes the user aware of an internet connectivity issue without looking at the software.

See Appendix A for more information about Datum Dialer internet connectivity.

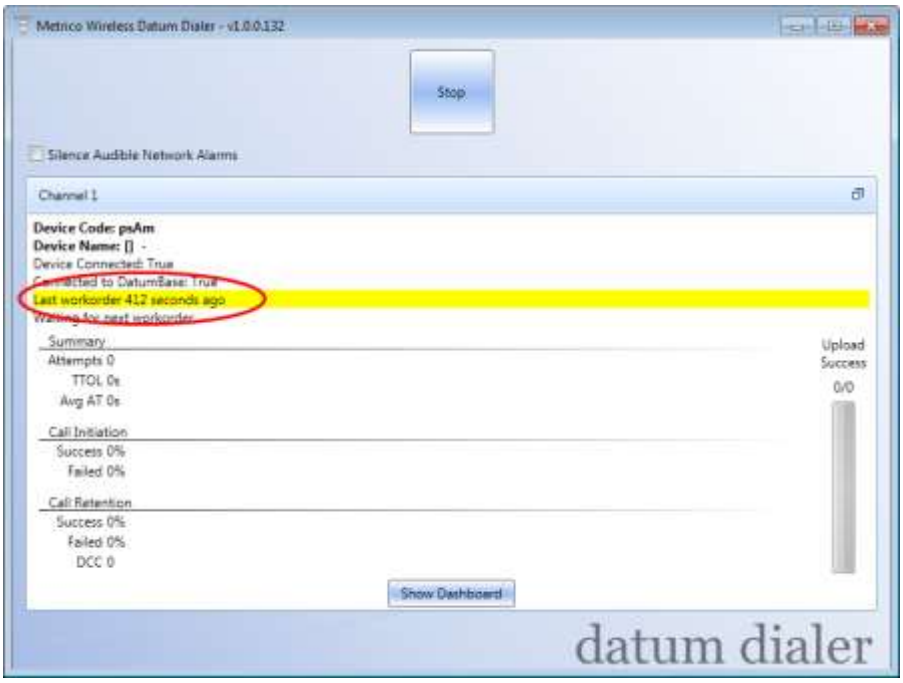

Figure 9-3 - Last Workorder Warning

10 Analyze the Results

When the Datum Test-Set has completed on the mobile device, use the **Stop** button to end the Datum Dialer session. In most cases, Datum Dialer will automatically upload the data collected on the test PC to the appropriate Datum Base project. Uploaded files will be listed on the **Complete** tab. If the session file appears on the **Incomplete** tab, please contact Metrico Support for troubleshooting assistance.

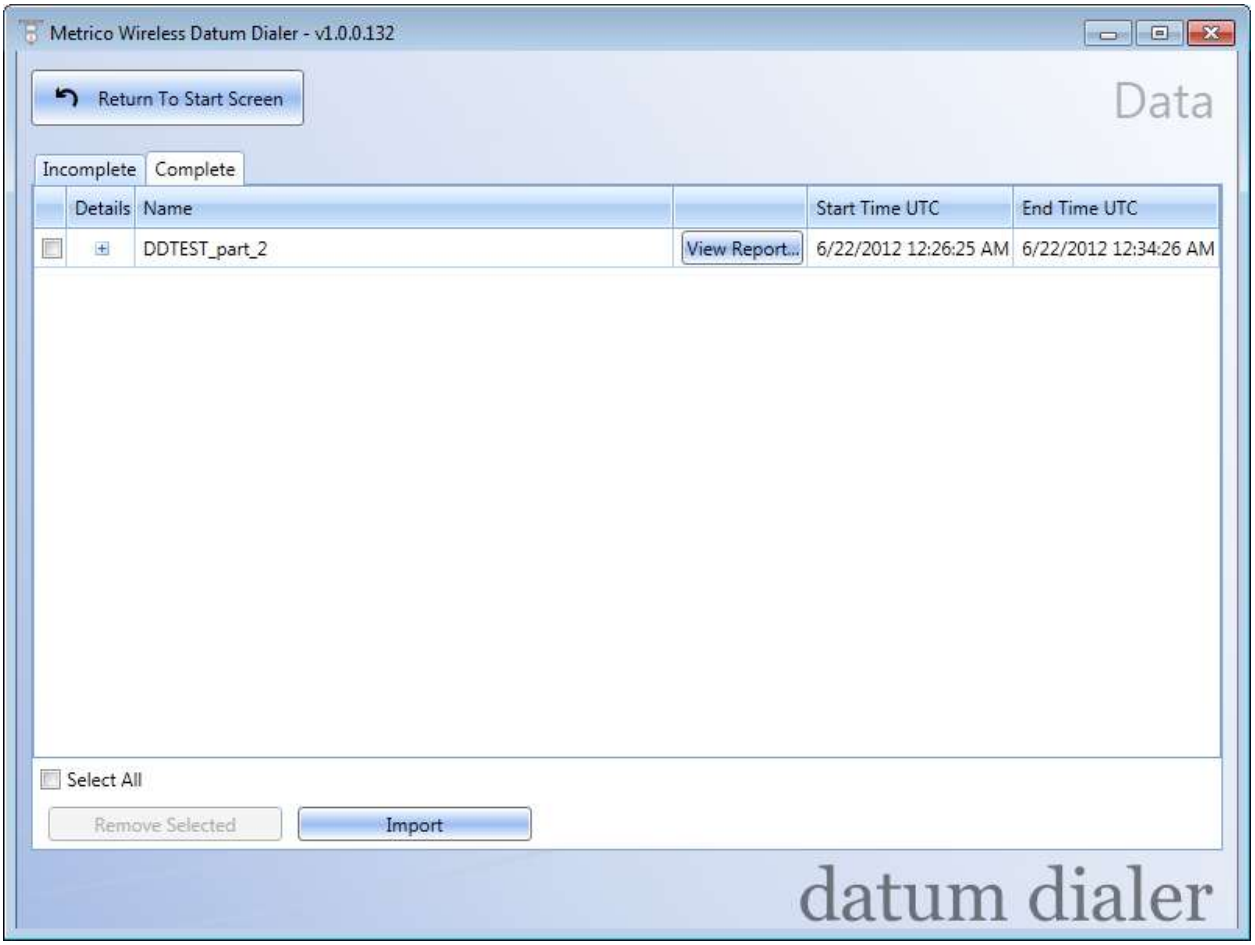

Figure 10-1 - Datum Dialer Complete

Note that this screen may be accessed with or without the hardware connected using the **Data** button on the Datum Dialer **Start Screen**.

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Following upload, call performance metrics collected with Datum Dialer will be available within the Datum Base project for analysis.

- From the Main Project Page select **View Project Metrics** and then click on the desired **Task** to drill down.

Task summary information is available for the following metrics:

- Call Duration
- Call Setup Time
- Throughput Before Call
- Throughput During Call
- Throughput After Call

The Call Performance area for the task provides call initiation and retention data.

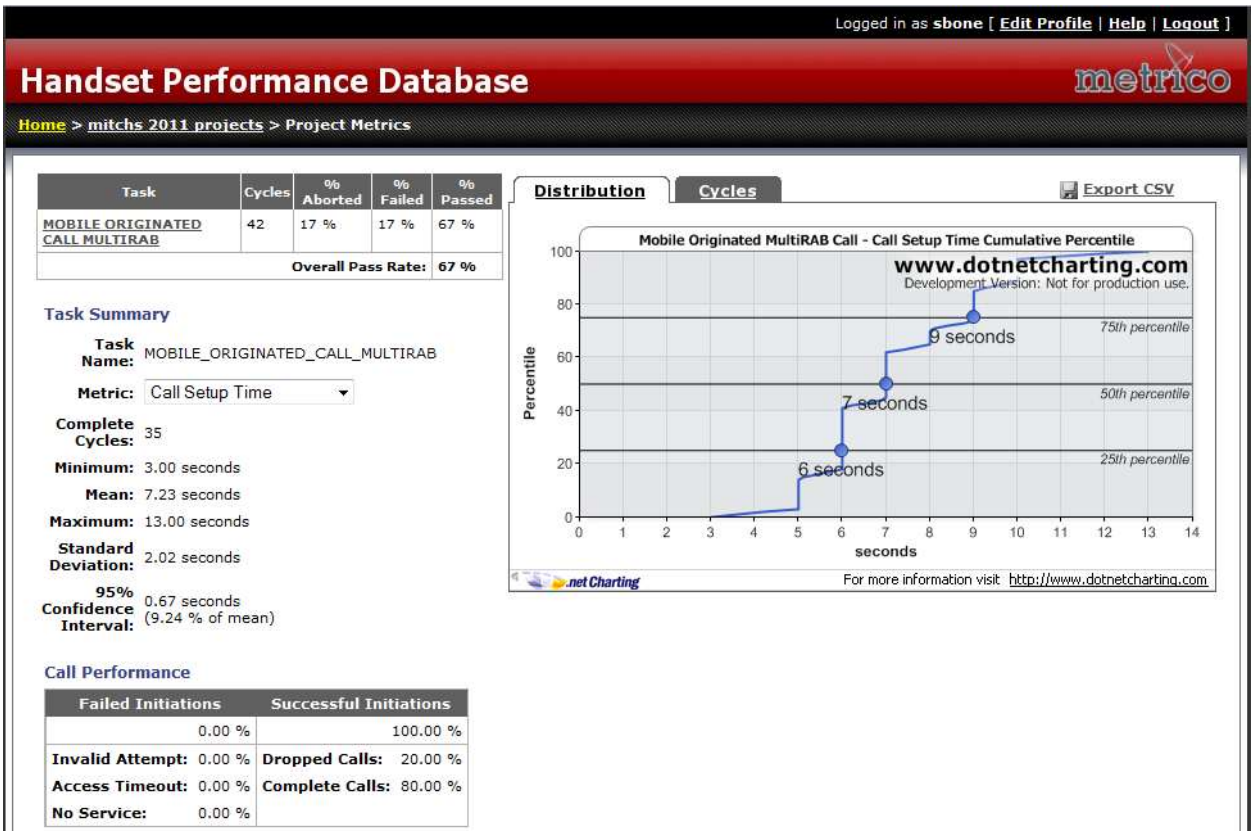

Figure 10-2 - Analysis Available within the Datum Base Project

Appendix A – Datum Dialer Internet Connectivity

As stated throughout this manual, Datum Dialer requires a dedicated internet connection while running tests. Datum Dialer uses the internet connection to communicate with the devices under test for the purpose of synchronizing when to dial, answer and hang-up the voice calls. The Datum Dialer software 'listens' for instructions from the Datum Mobile clients on when the voice calls should be setup and terminated (we call these instructions 'workorders').

The Datum Dialer application regularly few checks for new workorders every few seconds. A workorder will be issued by Datum Mobile for each individual call that needs to be placed.

The Datum Dialer user interface provides color-coded notifications to the user when a workorder has not been received for a specified period of time. Missing workorders typically indicate that either:

- The Datum test devices are no longer running.
- The test laptop has lost its connection to the internet and is no longer in communication with Datum Base.

Set the thresholds for the warning and error messages on the **Datum Dialer Settings → Task Settings** screen.

- A workorder warning will be displayed in yellow for a shorter outage.
- A workorder error will be displayed in red for a longer outage.
- An audible alarm will sound in the event that internet connectivity is lost. This makes the user aware of an internet connectivity issue without looking at the software.

If the internet connection is temporarily unavailable Datum Dialer will not receive the workorder for the current test and therefore not initiate the voice call. Datum Base will treat this as an incomplete test and will not include it in the statistics. As soon as the connection is restored the tests will automatically start working again.

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